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WAR DEPARTMENT

OFFICE OF THE CHIEF OF STAFF

WASHINGTON 25, D. C.

30 March 1947


MEMORANDUM FOR DIRECTORS OF GENERAL STAFF DIVISIONS:

SUBJECT: Military Communications Objectives.

Doctor Edward L. Bowles, Special Consultant to the Secretary of War, has submitted to the Chief of Staff the attached statement of Military Communications Objectives and recommends approval of his concept of this matter in order to establish military communications on a sound, integrated, progressive basis.

The Chief of Staff directs that a comprehensive analysis and General Staff study be conducted of this matter to determine the adequacy and feasibility of adopting these general objectives for the military establishment.

It is directed that the Director, Plans & Operations Division, monitor this study. Coordination with interested War Department agencies and the major commands should be effected in the preparation of this study.

  
J. W. BOWEN  
Colonel, GSC  
Secretary, General Staff

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Memo fr Dr. Edward L. Bowles dtd 27 Mar 47, w/incl.

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## WAR DEPARTMENT

WASHINGTON, D. C.

27 March 1947

MEMORANDUM FOR: General Eisenhower

SUBJECT: Military Communications Objectives

I have spent some time studying the broad problem of military communications and have reviewed my observations with your Advisory Group, whose active interest has been of great assistance. They have reviewed this memorandum and concur.

I shall outline what I believe to be salient objectives toward which our efforts should be directed.

- I. In the interest of national security we should work toward the realization of a unified global network designed to satisfy the administrative needs of Army, Navy, and Air.

It would also be the function of this network to make available along its routes channels for global weather, air transport control, intercommand, and other communications services. The user would have complete control of the terminals of these "leased" channels. This service by the global net would not be a bar to the installation by the user of communications facilities where the global network does not extend. These strategic networks would be exempt from theater control.

In fixed point-to-point communications, of which this global network is illustrative, we should make the utmost use of our commercial communications resources, which are acknowledged experts in this field. They would serve not simply as purveyors of equipment, individual talent, and manpower but as organic entities. Particularly in the event of emergency, by contract they would take over the technical planning, engineering, installation, maintenance, and operation of this facility.

The operation of this global communication system should be under an individual rather than committee command authority, answerable directly to the Secretary of National Defense or to the Joint Chiefs of Staff. Conceivably, this network would be made up of integrated components operated by the individual services.

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- II. Strategic planning of communications should be the responsibility of the Directorate of Plans and Operations, for it is an integral part of military planning and not a separate technical function.

Responsibility for the operation of the Army Communications Service - what is logically expanded into a component of the global network (described under I) - is not a logical function of Supply. The Commander of this net should be associated with a normal operating organization.

- III. Responsibility for the development of systems for tactical communications of ground and air forces should rest with these forces, just as the ultimate operational responsibility. This includes specialized communications such as that characteristic of air transport operation, which includes radio and radar navigational aids.

Since tactical communications is a field in which we must be the experts, there not being an equivalent to the commercial resource in fixed point-to-point communication, predominant emphasis of our internal resources in men and funds should be placed on the development of this field.

Although the individual tactical commanders must have control of their local or tactical communications, allowance must be made for possible interconnection with the global net. This applies to main trunks and particularly where the global network is extended forward with the advance of forces.

- IV. Responsibility for the procurement, storage and distribution of communications equipment is a normal supply function and therefore a proper function of the Signal Corps in its present organizational relationship to the Directorate of Supply. This relationship may be modified by the ultimate centralization of the procurement of common items as determined by unification.

Responsibility for the development of communications and electronic equipment peculiar to the ground forces should be left with the Signal Corps as a supply organization and for equipment peculiar to the Air Forces should be left with the Materiel Command, as a supply organization. This allocation should be reassessed when the problem of unification is resolved.

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We should work toward a War Department organization in which responsibility for basic research - research of common interest to various technical services and other military fields - is administered directly by a central authority, answerable to the Director of Research and Development.

- V. Policies on personnel, administration, and organization should recognize that military communications is a profession in itself, requiring not only able military leadership but able scientists, engineers, and managers.

These objectives are entirely consistent with your Policy Paper of 30 April 1946: SCIENTIFIC AND TECHNOLOGICAL RESOURCES AS MILITARY ASSETS.

Because of the imminence of unification legislation, it is my recommendation that the issuance of a formal, comprehensive policy paper on communications be deferred until after unification is achieved.

If you approve the general objectives I have set forth in this memorandum and are in accord with the substance of the accompanying background paper which I have prepared on "Military Communications and National Security," these should furnish sufficient guidance and authority to establish our military communications on a sound, integrated, progressive basis.

If it is your desire, I should welcome the opportunity to follow through for you the implementation of these objectives, cooperating with your Advisory Group, the Chief Signal Officer, and any others concerned.

*Edward L. Bowles*  
Edward L. Bowles

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WAR DEPARTMENT

WASHINGTON, D. C.

21 March 1947.

## MILITARY COMMUNICATIONS AND NATIONAL SECURITY

Whatever the ultimate structure of the armed forces, their joint effectiveness will depend to a large degree on the vision and understanding which will be brought to bear on the field of communications. The importance of electrical communications to national security demands that we consolidate our wartime progress in this field and lay clearly defined plans for the future. This involves not merely a critical analysis of the limitations of our present communications methods, but also a continuous reorientation of our thinking on communications.

In electrical terms the North and South Poles are but a fraction of a second apart; in actual communications often they are hours apart. Delays in communications are introduced by man with his propensity to overorganize, as seen in the separation of the message centers of the various services, in intolerable clerical delays, in untenable jurisdictional and priority disagreements -- all at the expense of unity of action and expedition. To remedy this situation we must surround the field of military communications with the distinction of a profession, bring into it able military leadership and able scientists, engineers, and managers. The field is too vast an activity, too critical to national security, and in many ways too refined to treat it as if it had to do mainly with telephone instruments, wires, radio sets, and other physical devices. A consistent effort must be made to explore fully the contributions which communications can make to strategic planning as well as tactical organization. On the success of this effort will rest much of the strength of our national security.

I The Problem of Civilian Resources

The recent war has clearly shown the contributions which civilian commercial and scientific organizations can make to the military field. Scientists in OSRD and organized aid to the Air Transport Command by commercial airlines organizations represent only two examples of successful cooperation. Still, only a beginning has been made in this field of harnessing civilian resources to the national defense effort. Too often in the past individuals, not organizations, have been integrated into the military structure. By this procedure the Army gained valuable assistance in solving specific problems, but lost the contributions which entire organizations as a team might have made to military operations. It is in this field that progress can and must be made.

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In the future the Army will not have the manpower, either in peace or in war, to develop independently all the aspects of national defense necessary for the country's security. Sound planning will demand more and more the close association of commercial, technological, and scientific organizations with the military effort.

The task which confronts us is well illustrated by the situation during the past war in the field of communications. Here the Bell System as an organization was never closely integrated into the armed forces. Specialists in the field of communications were consulted and used directly as individuals, not employed as a team.

Colonel Bickelhaupt was on the staff of the Signal Corps, and General Harrison was in charge of procurement, but the Bell System as such or the hundred odd planning engineers of the System at 195 Broadway were not used as a body for planning and operating purposes. President Gifford or a panel of company officials was not made part of our top planning agency. Similarly, though Sarnoff of RCA was put into uniform and, among other assignments, made responsible for the broadcasting of the Normandy invasion, the RCA organization was never integrated into our military structure.

Only by exploiting to the fullest our commercial resources can we hope to meet our future needs. Foresight, imagination, and willingness to bury pride will be essential in the management of our future communications.

One of the prerequisites in the field of communications will be a single global or strategic communications net. The least that the merger of Army, Navy, and Air should achieve is the over-all direction of electrical communications, which will insure a single global net at the disposal of the Commander in Chief, his Secretaries, and his Chiefs of Staff for the administration of world-wide military operations. Forewarned as we are of the tempo of any future war, it is inconceivable that this nation could tolerate as a part of its over-all security structure individual communications nets for the three primary branches of the armed forces. Coordination is no substitute for command, particularly when immediate action is vital.

At the same time such a global net must be planned to serve not only the over-all command, but also the many specialized operations which depend on global coordination. Sufficient "spare" or "private" lines must be available for use by the Air Transport Command for traffic control, by the weather services for global weather reporting, by Army, Navy, and Air commands for extensive operations like those of the 20th Air Force during the last war, by the intelligence services and the State Department for the rapid transmission of special information, and by other agencies which operate on a global scope. These channels would be leased to the using agencies, thus making unnecessary large scale independent installations of long distance communications facilities. With full operational control of the channel and its terminal equipment, the using agencies will, in effect, have their own communications system.

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Such a strategic net involves fixed point-to-point communications in which several of our commercial organizations are expert. Companies like Bell, RCA, Mackay, Tropical Radio, and others are in fact more expert than we can ever hope to be. To neglect these civilian resources and their possible contributions to the field of military communications as organic elements would lead to unnecessary duplication and retard progress. 110

In peace as well as in war the armed forces can and should depend on the experience of these commercial organizations, not only for the administration and operation of the strategic communications net, but also for the planning of its structure on the basis of military requirements. For this purpose a close working relationship must be established between the military and the civilian companies, and definite procedures must be worked out for the use of civilian facilities by the armed forces.

Research contracts should be drawn up, similar to Army Air Forces Project RAND, by which a select group from the management of an industry is kept briefed on military plans, so that research will be focused on military as well as civilian problems. Plans to overcome, in case of emergency, inadequacies and gaps in established systems should be elaborated at an early date. With such long-range planning the armed forces in time of war would merely have to expand existing facilities to have a full scale global communications net at their disposal.

The use of commercial resources for strategic communications does not remove the responsibility of the armed forces for the creation of dispersed tactical nets for the use of individual operational forces of the Army, Navy, and Air. Proper planning prescribes that the funds and men available for communications in the Army should be applied predominantly to the solution of tactical problems. Specialists must be trained to take care of the peculiar needs of the units they serve. Organizationally, such tactical nets should be under the complete control of the local commanders who would have at their disposal not only information received over their own local nets, but also data received over the strategic net. Therefore, not only must both types of communications nets be independent and complementary at the same time, but they must be interconnectable.

It is clear that commercial communications organizations can aid, but not completely solve, the military communications problem. Wherever a compelling civilian interest exists to develop new and improved communications, commercial organizations are likely to have important contributions to make. As has been pointed out, such a situation exists in the field of ordinary wire and radio communications. Experience has shown that great assistance can also be rendered in the establishment of a civilian air defense net as practiced in the United States during the early period of the war. Such assistance might also have been of immense value, if only used, in the restoration of civilian

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communications and utilities in the wake of battle area on the European continent, where the economic and social recovery of conquered and liberated areas would have been greatly facilitated by the organic use of communications companies experienced in these tasks.

Similarly, a thorough analysis should be made to see if the independent operation of our post communications system is in fact more economical than the leasing of facilities for this purpose from commercial companies. On the other hand, commercial companies, like the Bell System, are not directly interested in many specialized aspects of military communications, such as aircraft control with air-to-air and air-to-ground communications, and radio and radar navigational aids. These limitations of commercial organizations must be as realistically evaluated as the possible contributions which these private companies can make. ← NO

In order to take full advantage of these civilian resources the Army cannot wait for the development of another emergency before acquainting commercial companies with military problems, but must associate such companies with the military effort even in peace time. Their assistance in maneuvers should be solicited to give them experience in military communications problems. Their important role in long range planning and research needs no further elaboration.

Great benefits might be derived from the assignment of Regular Army officers to various parts of the Bell System, while at the same time officials of the Bell System would be assigned to the Army for work in planning, engineering, and operations. Commercial companies, seeing the importance of their role in national defense, will welcome such cooperation between the civilian and the military, if carried out with a full understanding of the importance of this effort.

In a modern Army, where in time of war civilians constitute the vast majority of officers and men, the use of civilians in time of peace must not encounter insurmountable barriers. The more firmly we can establish these principles, the more secure will be our evolving military structure.

## II The Problem of Personnel

Military communications demands the utmost in integration of effort. Within the services, progress in this field will depend more and more on efficient leadership and good management. The art of communications is growing too complex and our security requirements are becoming too urgent to treat this basic field casually.

A true communications system is an inspired, living mechanism composed of electrical machines and men subject to the will of command. Good communications cannot be purchased over the counter merely on demand. Only partial development in this field can be obtained by dependence solely on changes advocated by the user. Comprehensive planning in communications is based on the full understanding of the

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nature and potentialities of communications and of their importance in strategic as well as tactical planning. To achieve this end a new personnel policy is needed to attract into the field of military communications officers who combine qualities of leadership with professional education in scientific and engineering subjects.

At present the number of Regular Army officers with scientific and technical background is far too low for the job lying ahead. I believe it is true that the number of Regular Army officers well known today for their publications and achievements as great authorities in military communications or pre-eminent for their contributions in the field of electronics is negligible. If this situation continues we shall have technicians, but not men who are able to visualize changes in strategic plans through progress in communications.

We are also likely to encounter once more the same lack of understanding of civilian resources as during World War II when the Army failed to integrate the top level personnel of commercial communications organizations in its own structure. To remedy this situation will require a change in the Army's general personnel policy and, in particular, in its attitude toward technical training. Future needs demand that the Army acquire at least a sprinkling of officers in the successive age echelons professionally known as experts in such fields as communications, radar, meteorology, and the like. Not many of such men are needed, but, unless a few recognized leaders in these professions are developed, the Army will not be able to keep abreast of progress made in the field of communications or take full advantage of the contributions of outside resources to military operations.

The development of outstanding professionals in the field of communications requires a program of training which must be thorough and flexible at the same time. Carefully chosen candidates should be enabled after their elementary training to continue their studies on the doctorate and post-doctorate level. Candidates should be selected when young, like their civilian counterparts, or the gap between military and civilian in professional and technical activities will be increased.

The work on the graduate and post-graduate level should never be prescribed in detail, but the officer, just like the civilian student, should lay out his course in consultation with educational authorities. Such a training program, however, will produce results only if the men chosen for specialized education have the assurance that their professional accomplishments will lead to commensurate recognition in their military career. Never should men be penalized for having taken time out of their strictly military career to achieve an advanced degree. Moreover, within each specialized field in the Army an atmosphere conducive to professional activities should be established; the surest way to demoralize a professional group is to put it under management devoid of professional understanding. We must remember that no amount of technical equipment can equal the contributions which capable men can make in a professional field.

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To achieve this goal requires some modification of the current personnel policy of the Army. The concept of rotation, sound as it has been in the past and still is for strictly combat training, works to the detriment of specialized technical activities. Manifestly, with the increased scope of Army interests in the fields of science and technology as well as economics, sociology, and politics, no officer can be exposed to all of these experiences during his career in the Army. Such a policy, if attempted, would only lead to mediocrity.

Rotation, if carried out objectively, affords a means for selection of men with particular aptitudes; it is for this purpose that it is employed by the larger commercial concerns. In the Bell System a young man, thoroughly trained in the discipline of science and engineering, is rotated in order that he may find himself and that he may be assessed for permanent placement. There is no rule that in order to become a company president he must have had experience as a personnel man, a supply man, a researcher, an engineer, and a traffic manager. Similarly, within the Army there should be no tradition that in order to exercise the functions of command an officer must have gone through a rigidly prescribed tour of duty.

There must be equal opportunities for all, regardless of specialization. The promotion policy toward officers who are professional scientists and technologists must be as liberal as to professional line officers. Only in this way can the Army attract the talent it requires and carry fully its great responsibility in the scientific and technological fields.

The fact that in the past a shortage of Regular Army officers with sound background in scientific and technical fields existed may be attributed in many of the technical services to the lack of a personnel policy which made professional activities sufficiently attractive. To remedy this situation will require many years, even if corrective steps are taken immediately.

### III The Problem of Research

The need for professionally trained personnel becomes doubly clear when the true meaning of the word research is fully understood. Research does not include merely the development of equipment, but consists of the constant application of scientific data and theories to military problems.

In an age of rapid technological changes national security cannot be guaranteed by gradually applying scientific and technological advances to military equipment. Real military security can be obtained only by a continued and close relationship between the scientific and military field -- a relationship in which the scientist not only aids in the solution of current military problems, but also visualizes the possible effects of future research on strategic planning and tactical operations. The military field is full of opportunities for this type of research. A few illustrations will clarify this statement.

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During the last war the application of the orderly reasoning of mathematics and physics to the submarine problem led to numerical evaluation of the attacks on German submarines in the Bay of Biscay. Through this analysis, made by two outstanding British scientists, the devastating results of attacks on submarines in this area was proved beyond peradventure. Similarly, our own research talent analyzed the subject of submarine search by aircraft, and, by taking into consideration aircraft search characteristics and elapsed time between sighting and the beginning of search, showed clearly that under certain conditions aircraft operations against submarines were not only futile, but a waste of military effort.

Again, the study of whether the B-29's paid or not related the total manhours required to put a B-29 over a given city in Japan to the bomb damage in manhours dealt the Japanese economy, and thereby opened a vast field for future investigations.

The future role of the tank in ground warfare should be subjected to a similar type of analysis. We are faced today with the fact that projectiles can be made to penetrate most any armor with which a tank can be equipped. On this basis it may well be that there is no advantage in armoring tanks and that the premium may be on highly mobile vehicles, armored merely against small caliber fire and equipped with highly refined fire control so as to assure a single shot kill. Only a thorough scientific analysis of this problem will produce dependable results.

In the field of electronics and communications the possibilities of close and fruitful cooperation of the scientist and technologist with the military has already been demonstrated. The development of our efficient radar control of fighter bombers and the development of aircraft specifically designed for submarine search represent only two examples of such cooperation during the last war. In the future new equipment will have to be developed for the terminals of our communications systems to calculate, record, and sort instantaneously hundreds of messages, for in future operations the relatively slothlike speed of human agents can no longer be tolerated. Similarly, the contributions of facsimile transmission to military problems is just beginning to be investigated. Microwave communications are only in their infancy and offer challenging military possibilities for communications over line-of-sight paths. More advanced methods for secrecy in communications will have to be developed to preserve essential security in this field. The art and science of intercepting enemy messages with increased speed in their translation, analysis, and dispatch constitutes a field whose importance is recognized by everyone.

The field of radar and general electronics offers some of the most challenging problems. Radar, starting as a detecting device during the war, soon acquired such directional precision that it could be used for fire control and bombsights, for the landing of aircraft, and as a position finding device. But new and almost fantastic challenges are created by the increased speed of air vehicles, foreshadowed toward the end of the war. Radar as a warning device detecting enemy bombers at

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two hundred miles will one of these days be as outmoded as the B-17. Radar position finding means should rapidly replace the corresponding optical equipment, and electrical network devices should supplant mechanical directors in fire control. Radar devices for the location of the source of mortar fire and portable warning devices which cancel out "returns" from fixed objects to emphasize moving targets have already demonstrated their value to the ground forces.

Great possibilities for the use of electronics exist in the creation of new identification systems for air, ground, and sea forces; in the development of sea and air navigational systems, such as Loran, and of automatic flight control devices; in the field of meteorology, where radiosonde is used for upper air weather reporting, and the combination of radar and aneroid altimeters yield valuable information on local wind conditions, as well as the use of radar to locate storm centers. Infra-red devices can reveal warm bodies or help men to assemble in darkness. Television can be applied to homing missiles, to all-weather air navigation, and to instantaneous reconnaissance. The possible ramifications of electronics in the military field are virtually unlimited and transcend the specific interest of any one of the armed forces.

The full exploitation of this field requires more than the gradual development of new devices as new needs arise. What is needed is the encouragement of independent thinking on scientific problems and imaginative military leadership which will grasp the significance of theoretical scientific progress for military operations. Improved or new weapons and techniques can be developed in two ways: on the one hand through the experience of a user or operator who may uncover a peculiar need or suggest a device, and on the other through research motivated by the challenge to hurdle the barriers between the old and the new. Both of these paths are necessary, and both must be kept open.

If emphasis is placed in this paper on the research type of activity, this is caused by the fact that in the past its importance has not been sufficiently recognized in the armed forces, and that in the future national security will depend more and more on the contributions which research activities can make in the military field.

The idea that research effort can be ordered like a commodity or that the sole route to a useful military product is through the establishment of military characteristics must be abandoned. Basic research determines its own destiny. It is an inspired intellectual quest for something not found -- an exploration beyond known boundaries. Its results may be as revolutionary in the military field as the work on nuclear fission and jet propulsion, or it may furnish by-products as useful as the cloud dispersal techniques of Langmuir and Schaeffer, who made their discovery during their work on the de-icing of aircraft. Future progress in this field will depend on the understanding by the military of these characteristics of research and on the encouragement of trained scientists, both within and without the armed forces, to

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devote their time and their talents to the application of scientific and technological ideas to military problems. Until a secure world government has been established, such activities are paramount in the national defense effort.

#### IV The Problem of Organization

Even if the Army is successful in obtaining the help of commercial companies, in developing trained military personnel in communications, and in establishing a general understanding of the real meaning of research, it will still fail to get results unless its organization is adapted to the new needs. Responsibility for long range planning and control of research by authorities overburdened with problems of procurement and supply will only lead to mediocrity.

During the recent war the work of the Signal Corps suffered greatly through the extension of its responsibilities into the most diverse fields. The Signal Corps had to devote its energies to research, development, procurement, storage, and issue of all devices with electrical characteristics, including radar and complementary electronic equipment, radio and radar applications to air navigation and landing, the use of radar in fire control and bombing, meteorological equipment, proximity fuze components, infra-red devices, and identification equipment. In addition, it was responsible for pigeons and photography as well as the training of Signal units. Along with these varied jobs it was responsible for the planning, design, installation, maintenance, and operation of the War Department Command and Administrative Net.

With the prodigious growth in the application of new techniques, frenzied organizational changes were made to meet the new conditions. Still, the Signal Corps, overburdened by procurement and supply, continued to receive criticism and complaints. Investigations and emergency reorganizations only partially solved the problem. At one stage responsibility for all communications, radar devices and radio peculiar to air operations were transferred bodily to the Army Air Forces by General Marshall himself. To further the application of radar to air control and bombing, civilian specialists were sent to the combat theaters to work directly with field commanders and their staffs. These wartime makeshifts illustrate deeply rooted difficulties. There can be little doubt that many of the problems were caused by the consolidation of research, development, procurement, supply, and operational responsibilities in a single agency.

A solution to these problems might be found if procurement and supply organizations were limited to procurement and supply functions, and if long range planning in communications were centered in a top level war planning unit. It should be obvious that an organization already overburdened with the day-to-day problems of procurement and supply is not the proper place for the administration of research. This fact was partially recognized in the establishment of the Director of Research and Development, whose appointment broke the traditional and restrictive General Staff pattern.

Control of research by supply authorities implies that the supplier knows best what should be researched upon. Such a procedure does not create an environment conducive to true research and independence of thought. Likewise, it is doubtful if an organization continuously confronted by detailed problems of procurement and supply is able to see clearly the possible importance of new developments in communications on the formation of strategic plans and the organizational pattern of tactical units. Moreover, relations with outside organizations are likely to produce greater benefits if they are carried on by top officers or established scientists in the planning staff of the War Department, rather than by junior officers buried in the lower echelons of a technical service.

Unless the communications problem is studied in its entirety, i. e. in its total effect on the strategic and organizational planning of the armed forces, the potential contributions of this field to military security will not be realized.

The organizational problem of the Army might be clarified by examining the structure of the greatest communications system in the world -- the Bell System. The parent unit, the American Telephone and Telegraph Company (AT&T), is not unlike the War Department in its over-all direction of the smaller components of the organization. Within the AT&T there is a strong planning organization, including over one hundred engineers, whose interest lies in long range planning and the implications of new devices. The Long Lines unit ties together the associated operating companies of the Bell System. The functions of the Long Lines unit might be described as corresponding to those of a strategic network, and the functions of the associated operating companies as those of the various military departments and theater commands.

Serving the Bell System in research and development, including systems development, is the Bell Telephone Laboratories structure, which is answerable to the parent company. The president of the Laboratories is also a vice president of AT&T. Supply for the Bell System is provided by the Western Electric Company, a wholly owned subsidiary, which manufactures, warehouses, and distributes. Its management is completely independent of that of the Laboratories, and like the latter is responsible directly to the parent company. Its president is likewise a vice president of the AT&T.

When a developmental product within the Laboratories has reached the stage of imminent production it is examined by a group of production engineers from Western Electric, and upon transfer of the product to Western Electric a group of developmental engineers of the Laboratories follow it to aid in initial production. Thus research and development are organizationally separated from supply, and responsibility for planning is left neither to the local operating companies nor to the technical and supply organizations.

A similar organization for the War Department might greatly improve future progress in military communications. Such an organization was outlined by General Georges Doriot, formerly Director of the Military Planning Division, Office of The Quartermaster General, and now Professor of Industrial Management at the Harvard Business School, who proposed that the Chief of Staff be served by Directors of Military Planning, of Purchase-Supply-and-Issue, of Administration, and of Command. The Director of Military Planning would have under him technical, operational, and supply planning, together with intelligence. The Chief of Staff would also be served by a true general's staff in addition, free from the harrassing detail problems of everyday operations - not unlike your present Advisory Group. Such a structure would have among its great advantages the fact that it emphasizes the need of a true planning staff for the Chief of Staff, that it permits the consolidation of the technical services as they now exist, that it separates purchase and supply from research, and that it relates research and development to military planning.

In the past the War Department has lacked the organization essential to a progressive and understanding attitude of scientific and technological concepts. Notable and promising progress in this direction was made during the war. Your policy paper on "Scientific and Technological Resources as Military Assets" lays the foundation on which we can build a vigorous program for the use of civilian organizations in the military structure. It is time that these principles be applied to the field of communications -- one of the most vital elements in the pattern of our national security.

*Edward L. Bowles*

Edward L. Bowles

Attachment to Memorandum  
to General Eisenhower  
27 March 1947